

UNIVERSITY OF SASKATCHEWAN
COLLEGE OF AGRICULTURE

PROPERTY OF MAIN LIBRARY, DEPARTMENT
OF AGRICULTURE, OTTAWA

Lent to: *H. MacKay*
Date: *8-7-48* PLEASE RETURN
AL 32 9207-1PM-148

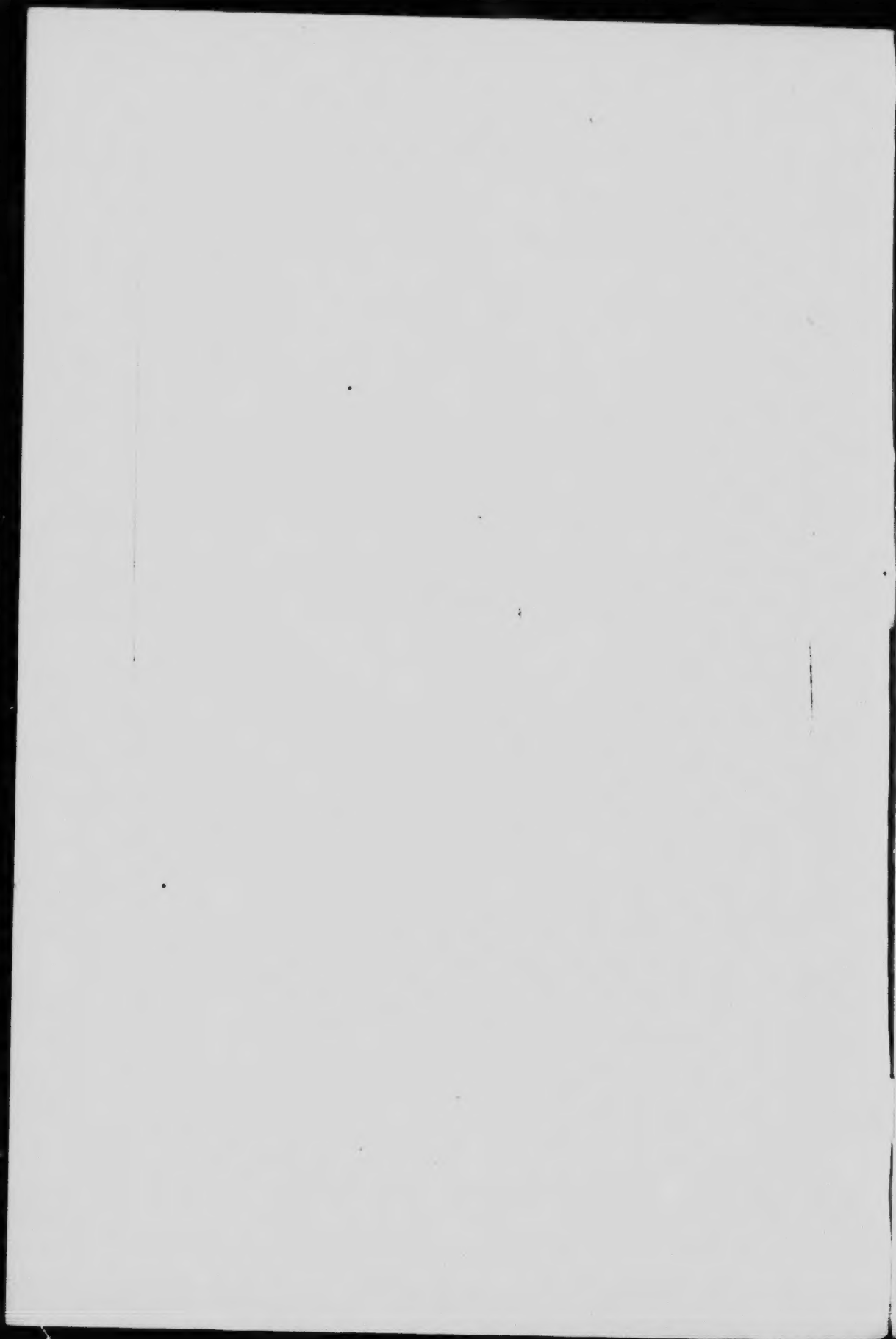
Butter Making
on the Farm

By

Professor K. G. Mac KAY
Assistant Professor of Dairying

SASKATOON, SASKATCHEWAN
1915

63.72
.S252



BUTTER MAKING ON THE FARM

BY

K. G. Mac KAY, Assistant Professor of Dairying

MUCH of the dairy butter made on Saskatchewan farms has in the past been marketed through the medium of the country store. The prices realised during the season of largest production have been low and in a great many instances the butter had to be exchanged for other articles instead of being sold for cash. Much of the dairy butter marketed has not been good when delivered at the country store and has been worse when shipped out.

Because of the prevailing low prices for dairy butter and the fact that no cash could be realized from its sale, an increasing number of farmers have commenced drawing or shipping their cream to a creamery. Those who are in a position to dispose of their cream to a creamery are, under existing conditions, probably well advised to continue or begin the practice.

The chief advantages of creamery as compared with farm dairy butter making are:

A better average product is produced because modern machinery is used and the work performed by skilled butter makers.

Larger cash returns are received by producers of cream than could be secured from the sale of dairy butter.

There is less labor required on the part of the female members of the household, where cream is sold instead of being made into butter on the farm.

There are some who have expressed a wish to know how to make better butter for their own use or to sell, because of being unable to dispose of their cream. In an endeavor to assist all such, the following information is offered:

Milk is composed of a number of constituents, some unimportant from the standpoint of the butter maker, others directly of importance. The average composition of milk may be said to be about as follows:

Water.....	87.10 per cent
Fat.....	3.90 per cent
Casein.....	3.00 per cent
Albumen.....	.40 per cent
Sugar.....	4.85 per cent
Ash.....	.75 per cent

100. per cent

Fat forms the most important constituent for butter making purposes and is present in the milk in the form of small globules. Water and to a less extent casein enters into the composition of butter. Milk sugar, because of the ease with which it breaks down, forming acid, has an important influence on the quality of the butter.

Milk which has been drawn from the cow under sanitary conditions should be separated immediately in a place free from dust, dirt and all objectionable odors. A cream testing about 35 per cent is recommended because there is a lesser volume to care for, the cream will keep sweet longer and churn easier than a thin cream. Immediately after separating cool down the cream to 50 degrees F., or below, if possible. The cream from the next and each succeeding separation should be cooled before mixing with cream from a preceding separation. When adding, stir the cream thoroughly in order to mix well the different lots of cream.

Sweet Cream Butter

In the past all butter manufactured was made from sour or ripened cream. There is a demand now for a milder flavor which is being largely met by creamery butter made from sweet or cream that is only very slightly sour. Makers of dairy butter may well attempt to supply butter made from sweet cream. Butter made from sweet cream will probably keep better and be more in demand than butter made from ripened cream. The objection is frequently met that sweet cream takes longer to churn and there is more loss in the buttermilk. The first objection may not be founded on fact and the latter, while possibly true, is of so little consequence that it may be neglected.

When enough cream has been collected to make a churning of butter add no more during the last eight or ten hours. This cream should be brought up to churning temperature and kept there for several hours before churning commences. Cream should be heated by placing the can or other container in water rather than heating over a fire or pouring hot water into the cream. Cream ready for churning should have a clean pleasant taste and smell and when poured be free from lumpiness.

The temperature to employ for churning will vary considerably. A safe rule is to adopt a temperature which will allow a small or medium sized churning of butter to be secured in from 20 to 30 minutes. The range of temperature will possibly run from 54—64 degrees F. Higher temperatures are usually required in winter than in summer.

The following factors influence churning:

(1) *Temperature.* The higher the temperature the less the time required.

(2) *Character of butterfat.* When the hard fats predominate as they usually do in winter, a higher temperature is required to enable the fat globules to unite, than is necessary when the soft fats are abundant as in summer.

(3) *Richness of cream.* In rich cream the fat globules are closer together than in thin, and unite more readily. Rich cream is consequently easier to churn than is thin cream.

(4) *Amount of cream in the churn.* The quantity of cream that will churn quickest is, a churn about one-third full. More or less than this amount prolongs the time required by reducing the concussion.

(5) *Speed of the churn.* The speed should be such as to produce the greatest amount of concussion. This can be learned by listening to the sound produced by the cream within the churn. Speed too slow or too fast prolongs the time required for churning and often injures the grain of the butter.

(6) *Abnormal fermentations.* Slimy or ropy cream is very viscous and in consequence is hard or impossible to churn.

The Churn and Its Preparation

The plain barrel style of churn without any interior fittings is the one to be desired above all others. The earthenware revolving churns are easily kept clean and are popular with some. A churn that will hold three times as much cream as requires to be churned should be purchased in preference to one any smaller.

A churn should be thoroughly scalded with hot water when preparing it for a churning. If it has become very dry since the last churning, rub well inside with salt to fill up the pores in the wood, after which rinse with cold water. When the churn has been cooled it is ready for the cream to be added. Prepare the worker, ladles and printer in the same manner.

All cream should be strained into the churn through a fine wire sieve or dipper with perforated tin bottom. This removes the possibility of particles of curd or dried cream getting into the churn and being incorporated in the butter. Butter color, if required to secure a proper shade, is added to the cream after it has been strained into the churn. Should the color have been forgotten until after the butter has gathered in the churn the color can be added at the time of working by thoroughly mixing with the salt, at the rate of from 2 to 4 drops per pound of butter. During the first few minutes of churning the plug should be removed occasionally to allow all the gas generated to escape. When the particles of fat have united to such an extent that they begin to be visible in the cream, the butter is said to "break" and the completion of the churning operation is near. When the butter is the size of wheat grains or kernels it is usually sufficiently gathered. The cover should then be removed and the butter examined. If there are no small particles of butter on the sides of the churn the churning is finished, otherwise a few more revolutions are necessary. The buttermilk should then have a thin, bluish, watery appearance. The higher the temperature at which the cream is churned, the greater the percentage of fat left in the buttermilk and the more casein will be incorporated with the butter.

The butter milk is drawn off through a strainer to catch any butter which may escape from the churn. When the buttermilk has almost ceased to flow, rinse off the butter and churn with a little water, allowing the water to escape from the churn. Temper the water employed for washing according to the condition of the butter and the season of the year. As much water as there was cream should be used and when being added to the churn should be strained through two or three thicknesses of cheese cloth. If the butter is firm enough the churn should be revolved immediately ten or twelve times, otherwise revolve five or six times then allow the butter to stand until sufficiently firm. Give five or six more revolutions then draw off the water. If the butter is in a granular condition, firm, of good flavor, and the wash water runs away clear, one washing is sufficient, otherwise a second or even third may be necessary. Too much washing destroys the fine flavor of good butter, but will assist in removing bad flavors. When the washing process has been completed the butter should be in a granular condition and in that condition can be most readily salted.

Salting

The butter should be salted immediately after the removal of the wash water. Use a fine, dry, easily dissolved, even grained, pure salt. The ease and thoroughness with which salt dissolves may be determined by adding a quantity to a tumbler of clear water. If there are many impurities present a turbid appearance and a slight sediment will usually be noticeable.

The rate at which butter should be salted will depend upon market requirements. Generally the variation will fall within the limits of 1-2 to 1 oz. per pound of butter. Salt is added primarily to give flavor to the butter and a fine flavored butter should not be spoiled by the addition of too much salt. If the flavor is not good, it is sometimes advisable to add more salt to hide the objectionable flavor. Salt increases the keeping quality of butter and butter which is to be kept some considerable time before marketing or being used may have more salt added than where the butter is for immediate consumption. Where butter is made on the farm in a barrel churn, it is well to salt in the churn using slightly more salt than where the butter is salted on the worker. When the percentage of fat in the cream is known, estimate the amount of butter you will have. Where the test is not known, estimate from a previous churning or weigh the butter. Spread the butter evenly over the bottom of the churn and sift on part of the salt. Tilt the churn forward to cause the butter to lap over, sift on more salt, then tilt the churn backward and put on the remainder of the salt, using a ladle if necessary to assist in the work. Put on the lid and slowly revolve the churn until the butter has collected in one or more lumps. If time permits, the butter should be left in this condition long enough for the salt to dissolve before working. One working on the lever butter worker will then be sufficient.

Working

When butter is removed from the churn place in the center of the lever butter worker and begin working in the center of the lump and then work from side to side. Pressure only should be used in the working process, for by sliding the lever a greasy, salvy butter is produced. When the butter is levelled over the worker, with the spade toss a little of it back from the left side to get the lever down on the board. Revolve the lever away from the butter and it will cause it to fall over and form a large roll. Press the lever well into the butter at the right hand side and with a quick movement make it bring the butter towards the center. Shift the roll lengthwise across the worker and begin again in the center and work as already indicated.

The object of working butter is to free it from excessive moisture, to remove the buttermilk, to mix the salt uniformly throughout the butter and to make the butter close and compact in body. Butter is usually worked sufficiently when a piece being cut and pressed between the spade and the worker, the moisture comes out in fine drops. Butter which is not worked enough after standing, shows an uneven color, waves, streaks or mottles, the lighter portion being the part unreached by the salt. Butter overworked has a greasy, salvy body or texture. Salt absorbs moisture and odors very readily and should always be kept in a place where the air is clean, dry and pure. Where a maple bowl or other convenient receptacle is used instead of a lever butter worker, the same principles apply. Work with the ladles by pressing down to compact the butter and expel the surplus moisture avoiding a sliding or gliding motion.

Packing

Butter for immediate consumption or for sale on local markets is most frequently put up in one pound bricks wrapped with damp parchment paper. The law now requires that all dairy butter put up in forms resembling those used for creamery butter, should be distinctly marked "dairy butter." Good parchment paper should be used having the name of the farm or dairy neatly printed on the paper. The one pound printer is ordinarily used for printing dairy butter, when butter is made on a small scale. Make the surface of the butter on the worker level and press down the printer until the mould is well filled. Cut with a butter spade the surplus butter from the bottom, first from the center to one end, then to the other. When removing the butter from the printer to the parchment paper, place the thumbs on the top of the handle and the fingers under the ledges at the ends and pull up rather than press down. Pressing down bulges the butter at the sides of the print.

Where there is danger of mould developing on the parchment papers the papers should be soaked in strong brine for 24 hours or a brine solution to which a quantity of formalin has been added.

When wooden packages are used for packing butter there is always more or less danger of the flavor from the wood being imparted to the butter. In order, as far as possible, to avoid this, the tubs should be treated before being used. Steam or scald thoroughly and then fill with hot water to which salt has been added and allow to stand for 24 hours. Scald a second time and then cool with cold water and line with parchment paper. Crock of varying sizes are frequently used for packing butter, and butter will keep better in them than in tubs or other wooden packages. Sometimes it is desirable to keep butter in rolls or prints at home, and brine can be used for the purpose. Add a cup of salt to two quarts of boiling water, allow to cool in the crock; place a weight on the butter to keep it submerged in the brine.

When the churning of butter has been packed away, the butter-worker, ladles and all utensils with which butter has come in contact should be washed. Employ a brush and water just warm enough to loosen the adhering butter, then hot water to which washing soda or powder has been added. Finally, scald thoroughly and put away in a clean, airy place to dry.

Difficulties in Churning

Difficulty in churning is usually due to one or more of the following causes: (1) thin cream; (2) low temperature; (3) high viscosity; (4) churn too full; (5) speed too low or too high; (6) advanced period of lactation; (7) colostrum milk; (8) abnormally rich cream.

Where there is a large amount of skim milk in the cream the fat globules do not have the same chance to come in contact as where a thick cream is churned. A thin cream, requires a high churning temperature. If, after half an hour's churning with cream at a low temperature, there is no sign of butter, the cream had better be removed and heated up eight or ten degrees. Never add hot water, for it will melt part of the fat, curdle the casein, and produces a pale colored, weak bodied butter. Cream low in butterfat always means a greater loss of fat in the buttermilk.

Sometimes the butter comes, but will not gather, remaining in the form of fine lumps or even as large as small shot. This may be due to the cream being too thin or to three other causes—cold cream, feed, or stripper cows. Locate the cause and remedy the defect if possible. Pasteurizing the cream at 185 degrees F. often greatly assists to secure easy churning.

Sometimes the cream foams badly and the cream occupies almost all the space within the churn. Sometimes a handful or two of salt and a little water 70 or 80 degrees F. will effect a remedy.